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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/840,178	04/24/2001	Toshifumi Nagaiwa	206342US2	2640

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EXAMINER

KACKAR, RAM N

ART UNIT PAPER NUMBER

1763

17

DATE MAILED: 06/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/840,178

Applicant(s)

NAGAIWA ET AL.

Examiner

Ram N Kackar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 5- 6, 9, 12, 14, 17, 19-21 and 25-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5, 6, 12, 17, 21 and 25-28 is/are allowed.
- 6) ☒ Claim(s) 1, 9, 14, 19 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Claim 4

1. Claim 4 was cancelled in amendment dated 09/20/2002 in paper no 7, But seems to appear in the latest amendment dated 5/27/2003. Please confirm the status of this claim.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1 and 9 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In this instance the specification does not support an electrically conductive focus ring. The specification on page 2 line 9 refers to it as being conductive or insulating material, while at page 11 line 4 refers it to be made of a conductive material such as silicon or silicon carbide. In the context of the invention this appears to be a thermally conductive material.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claim Claim1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nozawa Toshihisa et al (JP 07310187) in view of Faretra (US Patent Nr 4282924) and Kim et al (US 6096161).

Nozawa et al disclose a process chamber for semiconductor process, means for process gas, vacuum and for exciting plasma (Fig 1), a work table device comprising an electrostatic chuck having passage for cooling (Fig 1 and paragraph 7), a main surface (Fig 1 and abstract) for substrate and a sub-surface for a focus ring (Abstract), cooling mechanism for both main surface and sub surface (Paragraph 4-11) and a thermally conductive heat transfer medium for focus ring (Paragraph 10), a bolt which is equivalent to a clamp configured to press the focus ring against the sub surface (Fig 2-23), material of focus ring being ceramic (Para 02) whose conductivity could be adjusted (Para 05), where the cooling means maintains the substrate and the focus ring at the same temperature (Paragraph 10).

Nozawa et al do not explicitly disclose that the heat transfer medium for focus ring is a conductive silicon rubber and the material of the focus ring is electrically conductive.

Faretra discloses use of thermally and electrically conductive silicon rubber as a heat transfer medium and that the material is adhered by standard techniques (Col 3 line 35-36, line 63-68 and Col 4 line 1-2).

Kim et al disclose focus ring of aluminum to ensure uniformity of plasma density (Col 2 lines 11-14).

Therefore it would have been obvious to one of ordinary skill in the art at the time invention was made to use a good thermal/electrical transfer medium like silicon rubber to have

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good thermal conductivity between focus ring and the main surface and also provide same electrical potential on the two to have plasma uniformity.

6. Claim Claims 14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nozawa Toshihisa et al (JP 07310187) in view of Faretra (US Patent Nr 4282924).

Nozawa et al disclose a process chamber for semiconductor process, means for process gas, vacuum and for exciting plasma (Fig 1), a work table device comprising an electrostatic chuck having passage for cooling (Fig 1 and paragraph 7), a main surface (Fig 1 and abstract) for substrate and a sub-surface for a focus ring (Abstract), cooling mechanism for both main surface and sub surface (Paragraph 4-11) and a thermally conductive heat transfer medium for focus ring (Paragraph 10), a bolt which is equivalent to a clamp configured to press the focus ring against the sub surface (Fig 2-23), material of focus ring being ceramic (Para 02) whose conductivity could be adjusted (Para 05), where the cooling means maintains the substrate and the focus ring at the same temperature (Paragraph 10).

Nozawa et al do not explicitly disclose that the heat transfer medium for focus ring is a conductive silicon rubber.

Faretra discloses use of thermally and electrically conductive silicon rubber as a heat transfer medium (Col 3 line 35-36, line 63-68 and Col 4 line 1-2).

Therefore it would have been obvious to one having ordinary skill in the art at the time invention was made to use a good thermal transfer medium like silicon rubber to have good thermal conductivity between focus ring and the main surface.

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7. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nozawa Toshihisa et al (JP 07310187) in view of Shahvandi et al (US Patent Nr 5405491).

Nozawa et al disclose the need to press focus ring on to subsurface but do not disclose a clamp frame.

Shahvandi et al disclose a clamp mechanism for clamping flat horizontal objects from above and an extending portion extending downward and fixed to a fixing member (Fig 3-42), made substantially of ceramic (Fig 3 – 40 and Fig 4-46).

Therefore it would have been obvious to one having ordinary skill in the art the time invention was made to use a clamp of the type disclosed by Shahvandi et al for pressing the focus ring on to sub-surface for good thermal contact and efficient cooling.

Allowable Subject Matter

Claims 5, 6, 12, 17, 21 and 25-28 remain allowable after amending previously indicated dependent claims in to independent form.

Response to Amendment

Applicants arguments filed on 5/27/2003 have been considered but not found to be persuasive.

Applicant has argued that the focus ring of Nozawa et al is not made of an electrically conductive material. While Nozawa et al do not explicitly disclose the material of the focus ring,

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but focus rings of conductive material like metal are known for extending the plasma for uniformity as stated above (Kim et al)

Applicant's argument regarding clamp of Shahvandi et al being ordinary and made to accommodate wafers frequently exchanged is nor relevant. Shahvandi provides teaching for clamping flat objects to each other for good contact in a simple and a convenient way (Col 5 lines 34-40).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N Kackar whose telephone number is 703 305 3996. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703 308 1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9310 for regular communications and 703 872 9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0661.

RK

June 9, 2003.


GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700